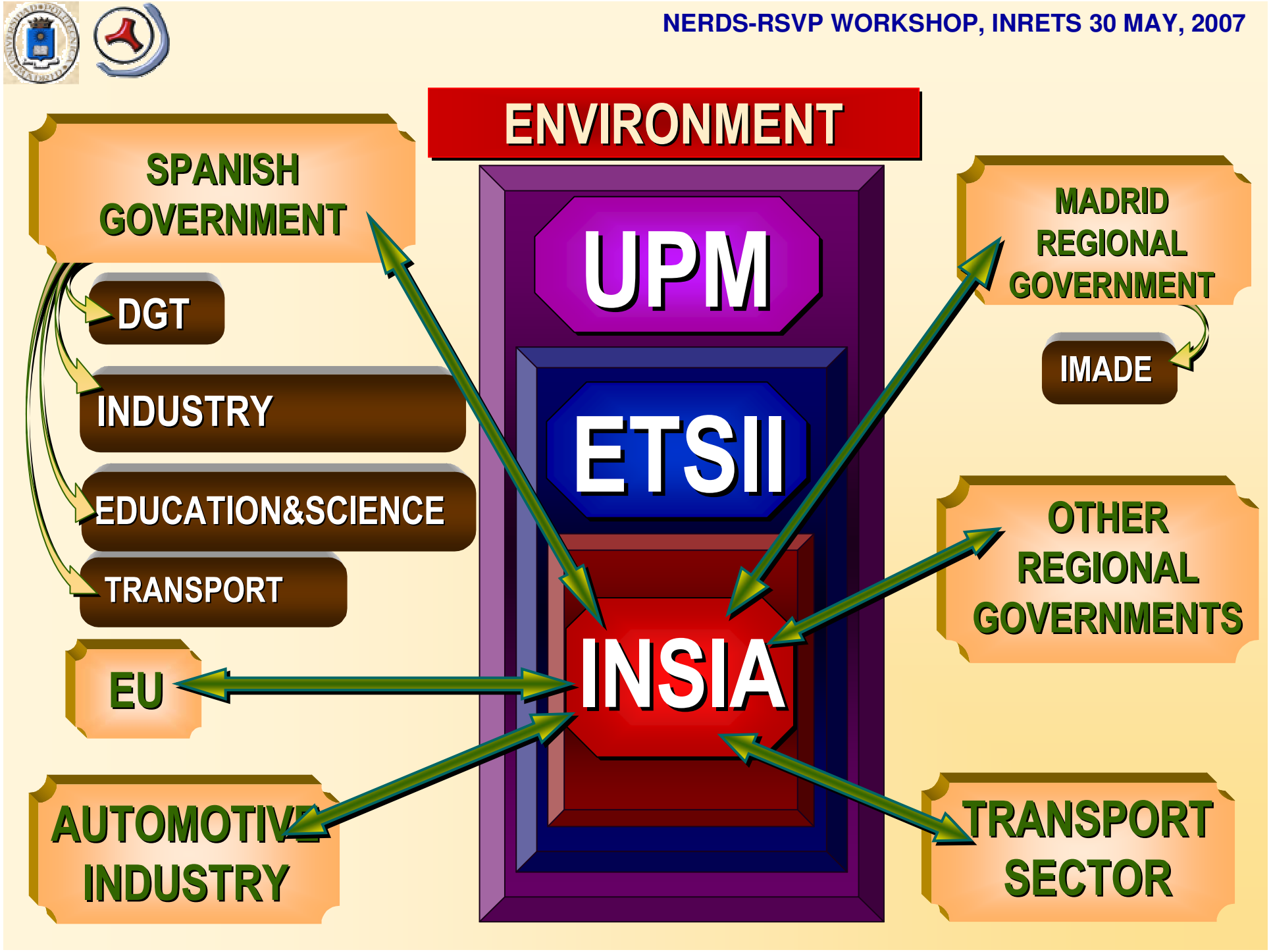
NERDS-RSVP WORKSHOP
INRETS 30 MAY, 2007

DRAG-SPAIN MODEL

Our interest in a model for Spain

Francisco Aparicio Izquierdo
Director of INSIA

UNIVERSITY INSTITUTE FOR AUTOMOBILE RESEARCH
INSIA


ENVIRONMENT
SPANISH GOVERNMENT
DGT
INDUSTRY
EDUCATION&SCIENCE
TRANSPORT
EU
AUTOMOTIVE INDUSTRY
UPM
ETSII
INSIA
MADRID REGIONAL GOVERNMENT
IMADE
OTHER REGIONAL GOVERNMENTS
TRANSPORT SECTOR

STAFF

INSIA IS COMPOSED OF A GROUP OF 90 PERSONS

- 15 LECTURERS OF THE UPM
- 38 ENGINEERS AND GRADUATED STAFF
- 17 SCHOLAR STUDENTS
- 20 ADMINISTRATIVE AND SERVICES STAFF

DOCTORS IN THE INSITITUTE 13

DIVISIONS

SAFETY AND INTELLIGENT SYSTEMS RESEARCH IN VEHICLES.

- ACCIDENTOLOGY AND VEHICLE DYNAMICS UNIT.
- BIOMECHANICS, COLLISIONS AND PASSENGERS PROTECTION UNIT.
- VEHICLE INTELLIGENT SYSTEMS UNIT.
- TRANSPORT RESEARCH UNIT.

COLLECTIVE, INDUSTRIAL AND SPECIAL TRANSPORT.

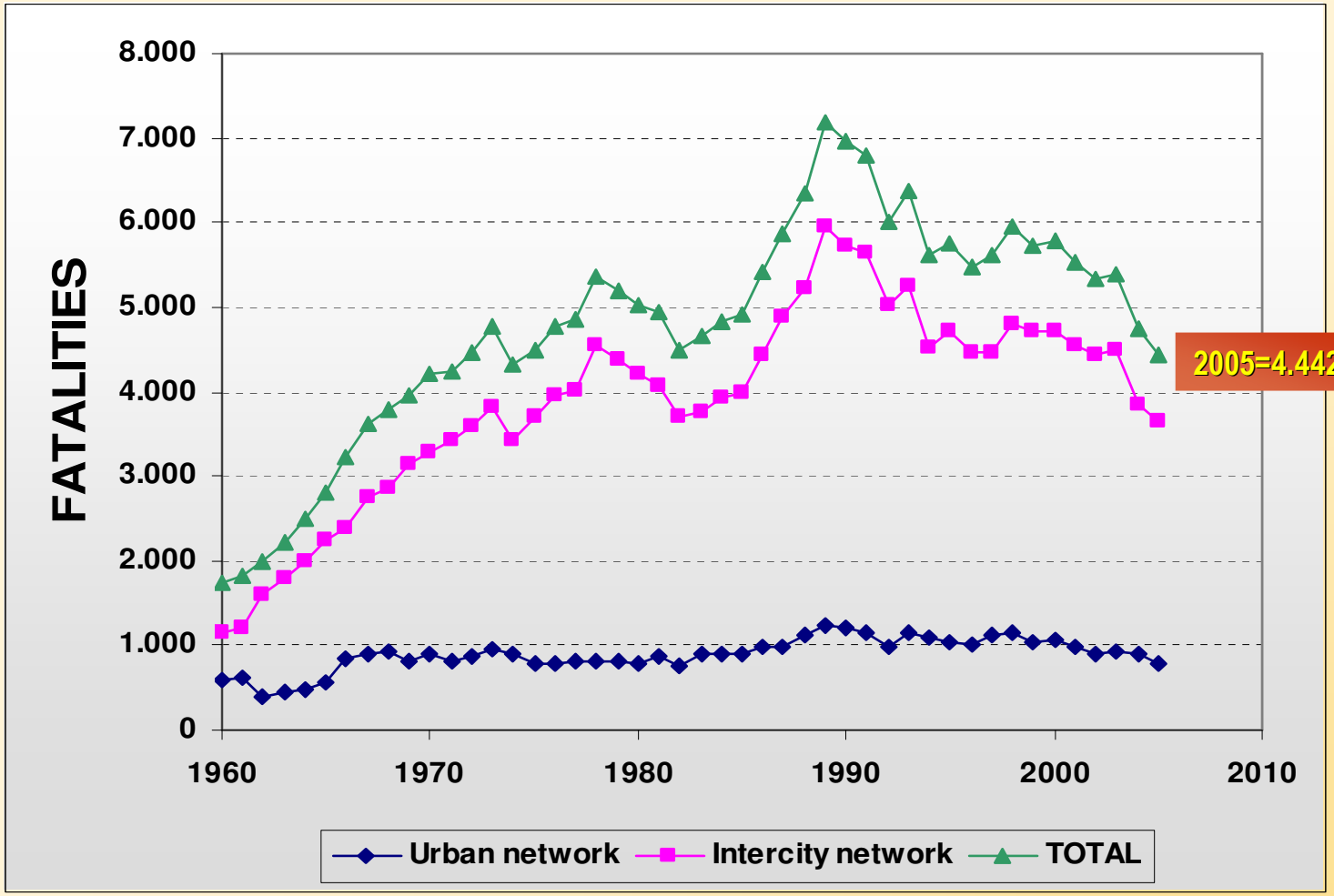
- BUSES, COACHES AND ACCESSIBLE TRANSPORT ENGINEERING UNIT.
- INDUSTRIAL AND SPECIAL VEHICLES ENGINEERING UNIT.

ACOUSTICS R&D.

OFFICIAL APPROVAL AND TESTS.

TRAINING, DIFFUSION AND DOCUMENTATION .

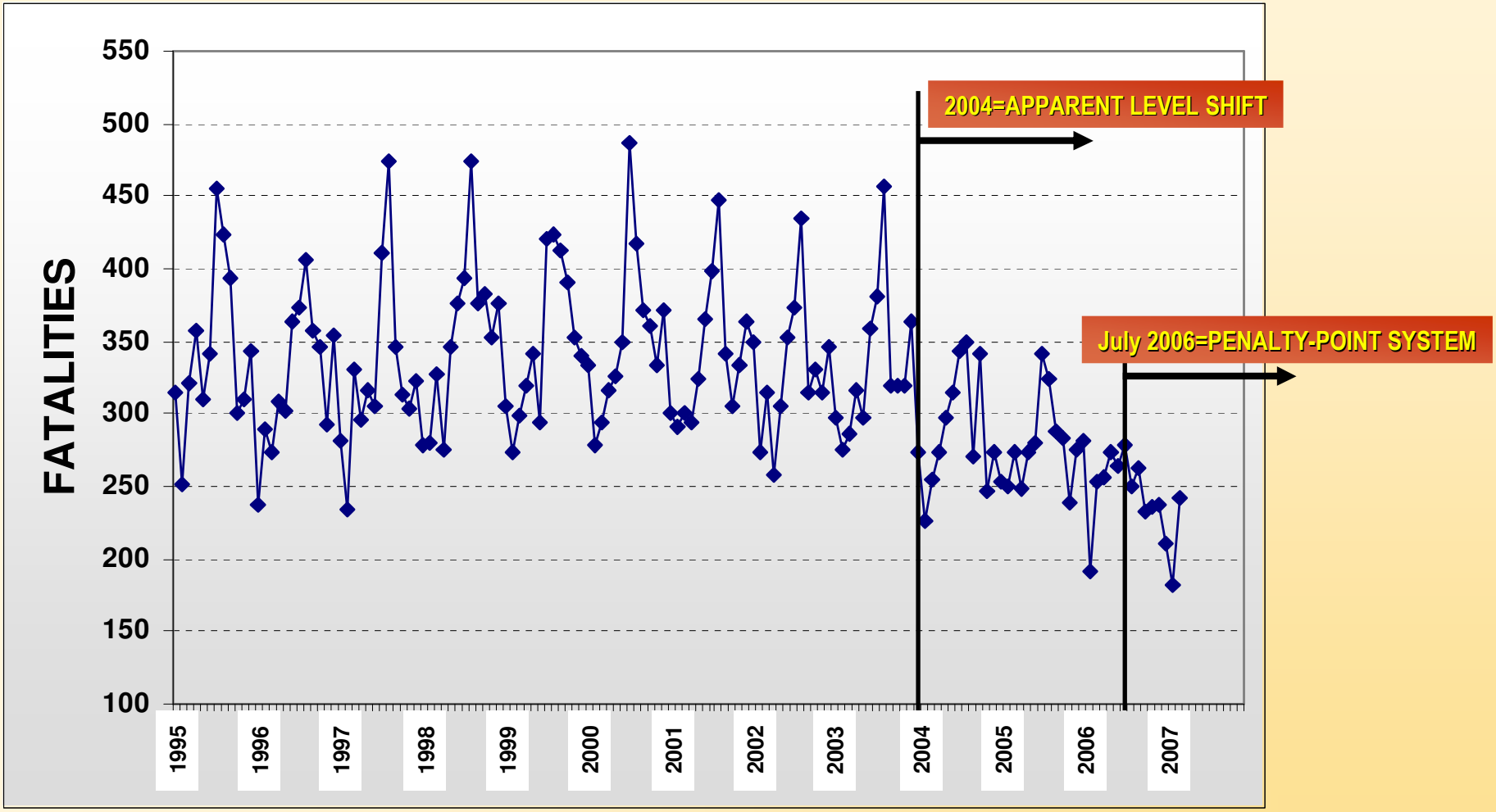
ROAD SAFETY IN SPAIN



Number of road fatalities. 1960-2005.

NOTE: From 1993, the number of fatalities comprise all persons killed within 30 days from the accident (previously: 24 hours).

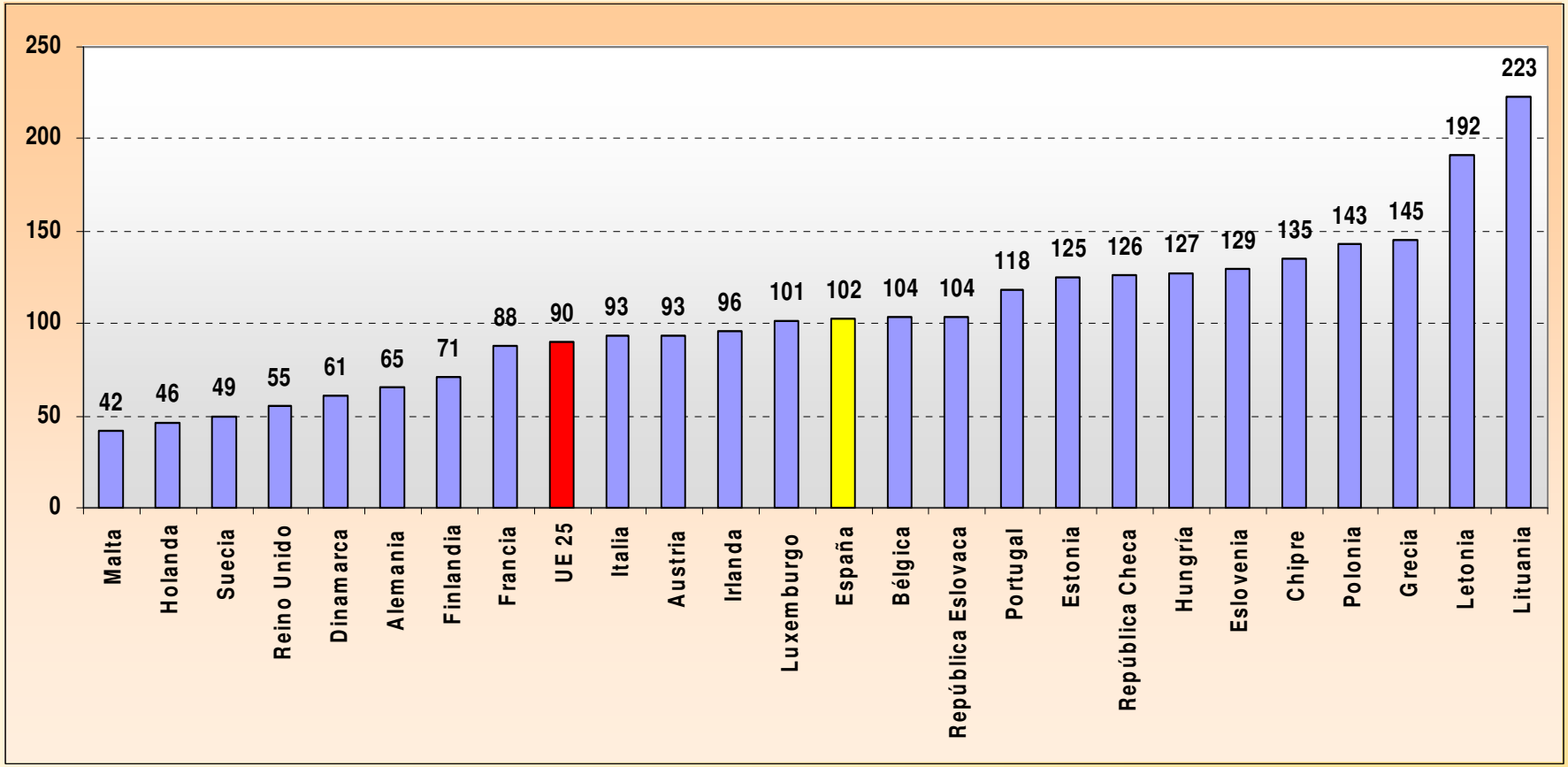
ROAD SAFETY IN SPAIN



Recent evolution of monthly road fatalities. 1995-2007.

NOTE: Persones killed within 24 hours days from the accident in intercity network.

INTERNATIONAL COMPARISON

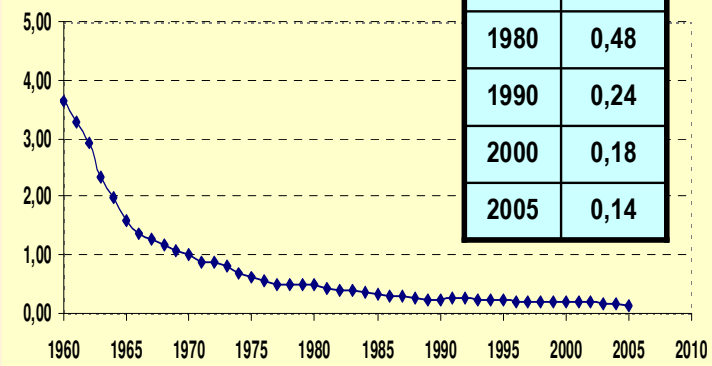


Number of fatalities per million inhabitants. EU-25, 2005.

INTERNATIONAL COMPARISON

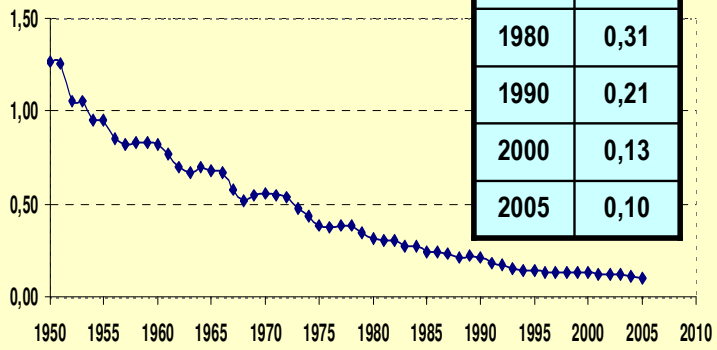
ITALY

1960	3,64
1970	0,99
1980	0,48
1990	0,24
2000	0,18
2005	0,14



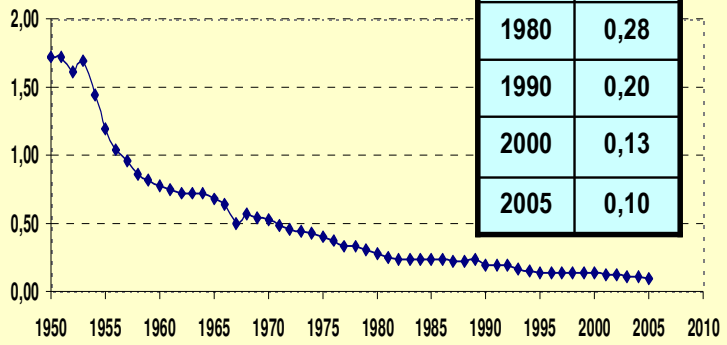
UNITED KINGDOM

1960	0,82
1970	0,55
1980	0,31
1990	0,21
2000	0,13
2005	0,10



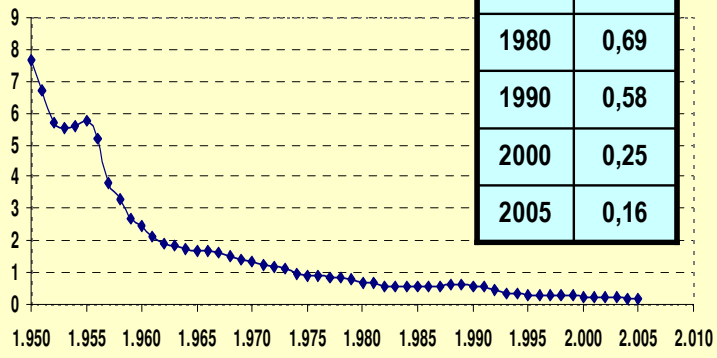
SWEDEN

1960	0,78
1970	0,53
1980	0,28
1990	0,20
2000	0,13
2005	0,10



SPAIN

1960	2,44
1970	1,35
1980	0,69
1990	0,58
2000	0,25
2005	0,16



Number of fatalities per thousand vehicles.

INSIA: TRANSPORT RESEARCH UNIT

RELEVANT PROJECTS:

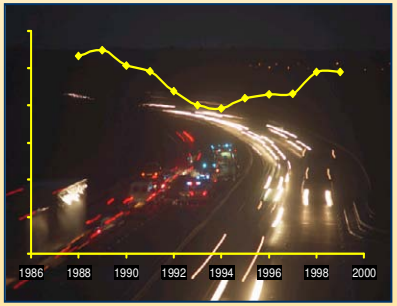
SETISMO: STUDY OF THE TRANSPORTATION SECTOR IN SPAIN.
FUNDING: NP R&D. 1999-2001.

SETRAM: SAFETY IN GOODS TRANSPORT: INFLUENCE OF MODAL SHIFT AND TECHNOLOGICAL EVOLUTION
FUNDING: M. TRANSPORT. 2004-2005.

MEITRAM: GOODS TRANSPORT IMPACT ON ENVIRONMENT AND ENERGY CONSUMPTION. INFLUENCE OF MODAL SHIFT.

FUNDING M. TRANSPORT. 2003-2004

DRAG-SPAIN: INTEGRATED METHODOLOGY FOR THE EVALUATION OF THE IMPACT OF TECHNOLOGICAL AND SOCIOECONOMIC VARIABLES ON SAFETY
NP R&D, DGT, ANFAC. 2005-2007.



BIG: DATABASE OF INFORMATION ABOUT MOBILITY, SAFETY AND ENVIRONMENT
FUNDING: FITSA. 2006.

Base BIG

BAROMETERS OF SAFETY AND EMISSIONS.
FUNDING: FITSA. 2006.

DGT AGREEMENT: DEFINITION, ESTIMATION AND ANALYSIS OF SAFETY INDICATORS
FUNDING: DGT. 2007-2008.

DGT Dirección General de Tráfico

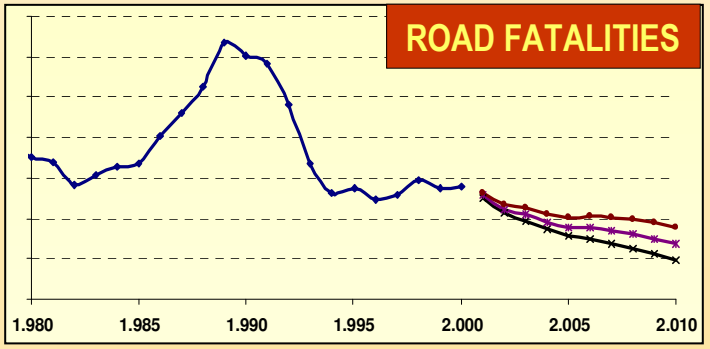
MIEVA: INTEGRATED METHODOLOGY FOR THE EVALUATION OF THE IMPACT OF GOODS TRANSPORT ON SAFETY
FUNDING: M. TRANSPORT, DGT. 2007-2009.

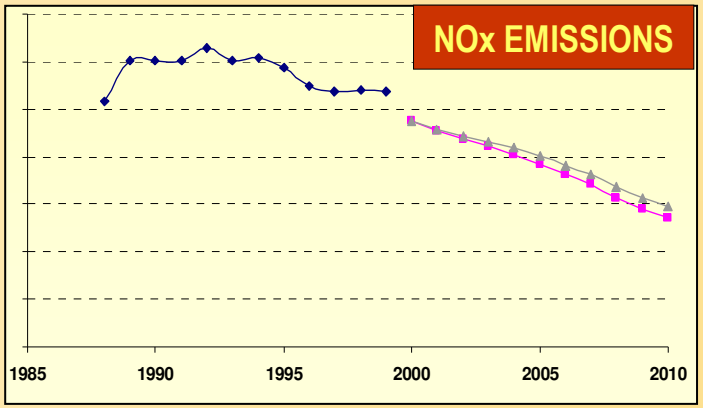
SETISMO PROJECT

Study of the transportation sector in Spain. Development and application of models for the analysis of the conditions for a sustainable growth of mobility (SETISMO project).

FUNDING: NATIONAL R&D PROGRAMME, ANFAC, RACE, AOP, AEC.

- √ TRANSPORT DATABASE
- √ COST OF ROAD ACCIDENTS
- √ POLLUTANT EMISSIONS
- √ FORECASTS 2000-2010:
  - ✓ MOBILITY
  - ✓ VEHICLE FLEET
  - ✓ FUEL CONSUMPTION AND EMISSIONS
  - ✓ ROAD FATALITIES



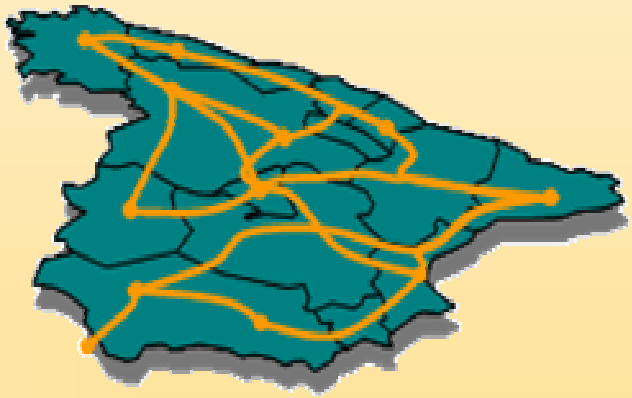


SETRAM PROJECT

SETRAM: SAFETY IN GOODS TRANSPORT: INFLUENCE OF MODAL SHIFT

FUNDING: NATIONAL R&D PROGRAMME, MINISTRY OF TRANSPORT.

- ⇨ STATISTICAL ANALYSIS OF FREIGHT TRANSPORT AND IDENTIFICATION OF RELEVANT TRANSPORT CORRIDORS
- ⇨ STATISTICAL ANALYSIS OF ACCIDENTS WITH HGVs
- ⇨ MODELLING OF HGVs TRAFFIC IMPACT ON SAFETY (POISSON MODELS)
- ⇨INFLUENCE OF MODAL SHIFT
- ⇨ APPLICATION TO RELEVANT TRANSPORT CORRIDORS



$$P(y(r,t)=m)=\frac{(\lambda(r,t))^m\cdot e^{-\lambda}}{m!}$$

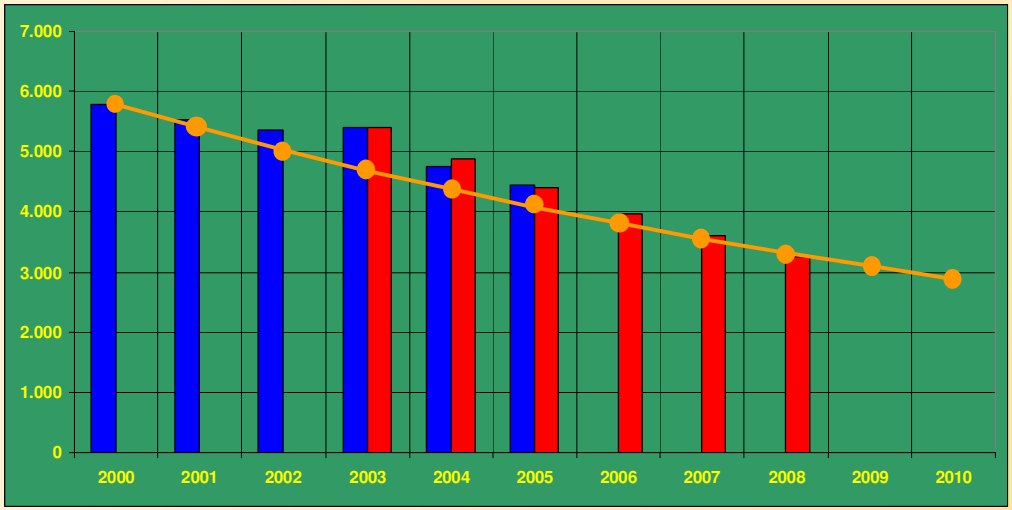
$$\lambda(r,t)=\exp(\sum\alpha_i\cdot x_i(r,t))$$

NATIONAL CONTEXT

DIRECTORATE-GENERAL FOR TRAFFIC (DGT):

ROAD SAFETY STRATEGIC PLAN 2005-2008.

FOR THE FIRST TIME IT SETS A QUANTITATIVE TARGET: **40% REDUCTION OF ROAD FATALITIES IN 2003-2008**. NOT BASED ON ANY SCIENTIFIC ASSESSMENT, BUT RATHER ON THE ADAPTATION OF THE EU OBJECTIVE TO THE GOVERNMENT´S CURRENT TERM.



DRAG-SPAIN

MOTIVATION:

√ Need of a scientific tool for:

- √ Assessing the influence of socioeconomic, technological and legislative variables.
- √ Evaluating the impact of different scenarios.
- √ Designing and evaluating road safety policies.
- √ Setting and monitoring national quantitative targets.

√ Lack of similar research in Spain.

√ Existence of a methodology succesfully applied in several countries and regions: DRAG models.

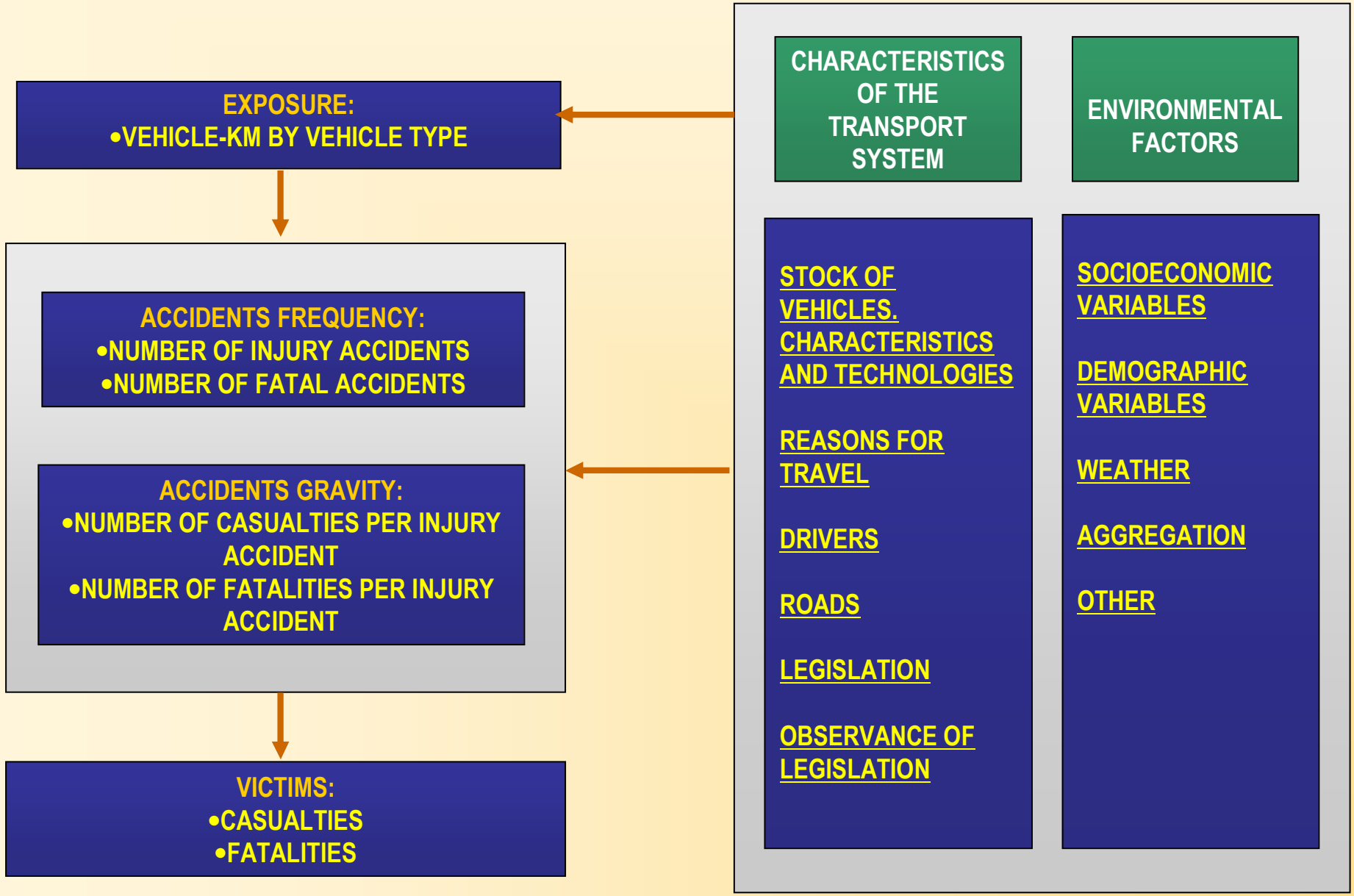
FUNDING:

National R&D Programme

Directorate-General for Traffic

Spanish Association of Automobile Manufacturers

DRAG-SPAIN


EXPOSURE:
•VEHICLE-KM BY VEHICLE TYPE
ACCIDENTS FREQUENCY:
•NUMBER OF INJURY ACCIDENTS
•NUMBER OF FATAL ACCIDENTS
ACCIDENTS GRAVITY:
•NUMBER OF CASUALTIES PER INJURY ACCIDENT
•NUMBER OF FATALITIES PER INJURY ACCIDENT
VICTIMS:
•CASUALTIES
•FATALITIES
CHARACTERISTICS OF THE TRANSPORT SYSTEM
ENVIRONMENTAL FACTORS
STOCK OF VEHICLES. CHARACTERISTICS AND TECHNOLOGIES
REASONS FOR TRAVEL
DRIVERS
ROADS
LEGISLATION
OBSERVANCE OF LEGISLATION
SOCIOECONOMIC VARIABLES
DEMOGRAPHIC VARIABLES
WEATHER
AGGREGATION
OTHER

DRAG-SPAIN

CURRENT STAGE: FINISHING DECEMBER 2007

FUTURE APPLICATIONS AND DEVELOPMENTS:

→ **APPLICATION OF THE DRAG-SPAIN MODEL TO ASSIST THE SPANISH DGT IN DESIGNING AND EVALUATING SAFETY POLICIES.**

→ **UPGRADING OF THE CURRENT VERSION OF THE MODEL.**

→ **DEVELOPMENT OF A `TRUCK ACCIDENTS DRAG MODEL´:**

MIEVA PROJECT:

- Approved: 2007-2009.
- Funding: Ministry of Transport, Directorate-General for Traffic.

MIEVA PROJECT